What is claimed is:

1. A confinement device for operative arrangement within a substrate etching chamber, comprising:

a lower surface of the device generally arranged over a substrate outer top surface such that a spacing therebetween is generally equidistant;

said spacing being less-than an inner width of an aperture through said lower surface; and

said aperture in communication with a channel in which an etchant gas is confined for reaction to selectively etch a localized area in said substrate outer top surface generally below said aperture.

2. The device of Claim 1 wherein said substrate outer top surface is generally planar, said spacing is less than one-half of said inner width, and said localized area in said substrate outer top surface is over a prior-defined recess.

3. The device of Claim 2 wherein said spacing is between 24 microns and 1001 microns and is positioned over an area on which microcircuits are fabricated, and said reaction in said channel comprises formation of a higher intensity plasma.

4. The device of Claim 1 wherein said device lower surface is contoured, said aperture is generally circular, an inner-wall of said channel is generally vertical, and said inner width has a value that is at least three times greater than said spacing.

5. The device of Claim 1 wherein said aperture is generally circular, an inner wall of said channel is generally tapered, said localized area in said substrate outer top surface is of silicon-oxide, and said spacing is less than one-fourth of said inner width value.

6. The device of Claim 1 wherein the device is in contact with a perimeter of said substrate outer top surface so that said spacing covers an area on which microcircuits are fabricated, said reaction comprises formation of a higher intensity plasma, said spacing is less than a sheath thickness of said plasma, and said localized area in said substrate outer top surface is of a material selected from the group consisting of silicon, silicon-oxide, and silicon-nitride.

7. The device of Claim 1 wherein said reaction in said channel comprises formation of a higher intensity plasma, said spacing is less than a sheath thickness of said plasma, and said localized area in said substrate outer top surface is of a metal selected from the group consisting of titanium (Ti), titanium-nitride (TiN), aluminum (Al), copper (Cu), tungsten (W), tantalum (Ta), tantalum-nitride (TaN), molybdenum (Mo), and niobium (Nb).

8. The device of Claim 1 wherein said spacing covers the whole of said substrate outer top surface, said lower surface of the device is made of a dielectric material, said aperture is generally oval, and said channel has a conductive liner extending at least partially therealong.

9. The device of Claim 1 wherein said reaction in said channel comprises formation of a higher intensity plasma, said spacing is greater than 24 microns and less than a sheath thickness of said plasma, and said device has been fabricated of a dielectric material.

10. The device of Claim 1 further comprising a second aperture through said lower surface, said second aperture in communication with a second channel in which said etchant gas is also confined for reaction to selectively etch a second localized area in said substrate outer top surface generally below said second aperture; and wherein said spacing is less than one-third of an inner width of said second aperture.

11. The device of Claim 10 wherein said reaction in each of said channels comprises formation of a higher intensity plasma, each of said localized areas in said substrate outer top surface is of a material selected from the group consisting of silicon, silicon-oxide, and silicon-nitride located over a respective prior-defined recess.

12. The device of Claim 10 wherein the inner walls of said channels are generally tapered, said inner width of said apertures being smaller than an inner diameter of a corresponding entry port of each of said channels, and said localized area in said substrate outer top surface is of a metal selected from the group consisting of titanium (Ti), titanium-nitride (TiN), aluminum (Al), copper (Cu), tungsten (W), tantalum (Ta), tantalum-nitride (TaN), molybdenum (Mo), and niobium (Nb).

13. A system for dry etching an integrated circuit (IC) wafer, comprising the device of Claim 1 placed within a substrate etching chamber using radio-frequency (RF) energy to induce and sustain an RF plasma within said channel; wherein said localized area in said substrate outer top surface is over a prior-defined recess.

14. The system of Claim 13 further comprising a chuck for supporting the IC wafer, said chuck having a contoured top surface and in electrical connection with a capacitive element, and a counter-electrode positioned above the device; and wherein the device has been machined of a metal.

15. A system for dry etching an integrated circuit (IC) wafer, comprising:

a substrate etching chamber having a remote microwave etchant gas cavity and a passageway for flow of said etchant gas to the device of Claim 1; and

the device wherein said spacing is between 24 microns and 501 microns, the device is in contact with a perimeter of said substrate outer top surface, and said perimeter is clamped to a wafer support member.

16. A system for dry etching an integrated circuit (IC) wafer, comprising:

the device of Claim 1 placed within a substrate etching chamber using radio-frequency (RF) energy to induce and sustain an RF plasma within said channel, and a counter-electrode positioned above, and in contact with, the device; and

wherein the device further comprises a second aperture through said lower surface, said second aperture in communication with a second channel in which said etchant gas is also confined for reaction to selectively etch a second localized area in said substrate outer top surface generally below said second aperture, and each of said channels has a conductive liner extending at least partially therealong, said liner in electrical contact with said counter-electrode.

17. The system of Claim 16 further comprising a chuck in electrical connection with a capacitive element; and wherein said spacing is between 24 microns and 1001 microns and covers the whole of said substrate outer top surface including an area on which microcircuits are fabricated.

18. A system for dry etching an IC wafer, comprising:

a substrate etching chamber comprising an inductively coupled plasma reactor, and a chuck for supporting the IC wafer, said chuck in electrical connection with a capacitive element and a radio-frequency (RF) source; and

the device of Claim 1 wherein said reaction in said channel comprises formation of a higher intensity RF plasma.

19. The system of Claim 18 wherein said plasma reactor comprises an antenna, said spacing is less than a sheath thickness of said plasma, said device is in contact with a perimeter of said substrate outer top surface so that said spacing covers an area on which microcircuits are fabricated, an inner wall of said channel is generally tapered, and the device has been machined of a metal.

20. The system of Claim 18 wherein said spacing covers the whole of said substrate outer top surface, an inner-wall of said channel is generally vertical and made substantially of a dielectric material, and said lower surface of the device is made of a conductive material.

21. The system of Claim 18 wherein said spacing is positioned over an area on which microcircuits are fabricated, and wherein the device has been fabricated of a ceramic.

22. A method for selectively etching a localized area in a substrate outer top surface, comprising the steps of:

arranging a lower surface of a confinement device over the outer top surface, leaving a spacing therebetween, so that an aperture through said lower surface is located generally above the localized area; and

providing an etchant gas to a channel in said device that is in communication with said aperture, said spacing being less-than an inner width of said aperture so that a higher intensity reaction can occur within said channel.

23. The method of Claim 22 wherein said step of arranging a lower surface further comprises placing said device in contact with a perimeter of the outer top surface such that said spacing is generally equidistant over at least an area of the outer top surface on which microcircuits are fabricated, and wherein said spacing is less than a sheath thickness of said etchant gas.

24. The method of Claim 22 wherein said etchant gas, within said channel, is a radio-frequency (RF) plasma and said spacing is less than a sheath thickness of said RF plasma; and further comprising the step of inducing and sustaining said RF plasma with RF energy within an etching chamber into which the outer top surface has been placed.

25. The method of Claim 22 wherein said higher intensity reaction comprises formation of a higher intensity plasma by using microwave energy from a remote source, and said step of providing an etchant gas further comprises directing a flow of said etchant gas through an entry port of said channel for said reaction.

26. The method of Claim 22 wherein said step of arranging a lower surface further comprises positioning said device such that said spacing is between 24 microns and 1001 microns and covers the whole of the outer top surface; and wherein the localized area in the outer top surface is of a material selected from the group consisting of silicon, silicon-oxide, and silicon-nitride.

27. The method of Claim 22 wherein said step of arranging a lower surface further comprises positioning a second aperture through said lower surface above a second identified localized area in the outer top surface, said second aperture in communication with a second channel; and wherein each of said localized areas in the outer top surface is made of a metal selected from the group consisting of titanium (Ti), titanium-nitride (TiN), aluminum (Al), copper (Cu), tungsten (W), tantalum (Ta), tantalum-nitride (TaN), molybdenum (Mo), and niobium (Nb) located over a respective first and second prior-defined recess.

28. A method for selectively etching a localized area in a substrate outer top surface, comprising the steps of:

arranging a lower surface of a confinement device over the outer top surface, leaving a spacing therebetween that covers at least an area of the outer top surface on which microcircuits are fabricated, so that an aperture through said lower surface is located generally above the localized area; and

providing an etchant gas to a channel in said device that is in communication with said aperture, said spacing being generally less than a sheath thickness of said etchant gas.

29. The method of Claim 28 wherein said etchant flows through an entry port of said channel, said channel entry port having an inner diameter less than an inner width of said aperture; and further comprising the step of inducing and sustaining a radio-frequency (RF) plasma within said channel by applying RF energy with an inductively coupled antenna located immediately outside a vacuum etching chamber into which the outer top surface has been placed.

30. The method of Claim 28 wherein said step of arranging a lower surface further comprises positioning a conductive surface of said device such that said spacing is between 24 microns and 1001 microns and covers the whole of the outer top surface, an inner-wall of said channel having been made substantially of a dielectric material.

31. The method of Claim 28 wherein said step of arranging a lower surface further comprises placing said device in contact with a perimeter of the outer top surface and positioning a second aperture through said lower surface above a second identified localized area in the outer top surface, said second aperture in communication with a second channel; and wherein each of said localized areas in the outer top surface are over a respective first and second prior-defined recess.

32. The method of Claim 28 further comprising, prior to said step of arranging a lower surface, the step of positioning an IC onto a chuck with a contoured surface for support under a counter-electrode; and wherein said step of arranging a lower surface further comprises positioning said device such that said spacing is generally equidistant

and greater than the largest expected contaminant particle that may be within said spacing.

33. The method of Claim 28 wherein said step of arranging a lower surface further comprises positioning said device such that said spacing is generally equidistant over said area on which microcircuits are fabricated, said device has been machined of a metal, and the localized area in the substrate outer top surface is of a material selected from the group consisting of silicon, silicon-oxide, and silicon-nitride.